Electronic TUBES

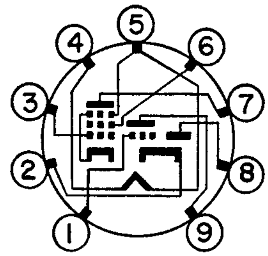
12FR8

DIODE—TRIODE—PENTODE

DESCRIPTION AND RATING

The 12FR8 is a miniature diode-triode-pentode intended for use as a combined intermediate-frequency amplifier, detector, and audio-frequency amplifier in automobile receivers. The tube is specially designed to operate with its plate and screen voltages supplied directly from a 12-volt storage battery.

BASING DIAGRAM



EIA 9KU

TERMINAL CONNECTIONS

Pin 1—Triode Grid
Pin 2—Triode and Diode Cathode
Pin 3—Pentode Grid Number 1
Pin 4—Heater
Pin 5—Heater, Pentode Cathode, Pentode Grid Number 3, and Internal Shield
Pin 6—Pentode Grid Number 2 (Screen)
Pin 7—Pentode Plate
Pin 8—Diode Plate
Pin 9—Triode Plate

GENERAL

ELECTRICAL

Cathode—Coated Unipotential

Heater Voltage, AC or DC	12.6*	Volts
Heater Current	0.32	
Direct Interelectrode Capacitances†		
Pentode Section		
Grid-Number 1 to Plate: (Pg1 to Pp), maximum	0.015	μμf
Input: Pg1 to (h+Pk+Pg2+Pg3+i.s.)	8.5	μμf
Output: Pp to (h+Pk+Pg2+Pg3+i.s.)	5.5	μμf
Triode Section		
Grid to Plate: (Tg to Tp)	1.7	μμf
Input: Tg to (Tk+h+Pk+Pg3+i.s.)	2.6	μμf
Output: Tp to (Tk+h+Pk+Pg3+i.s.)	2.0	μμf
Pentode Grid-Number 1 to Triode: (Pg1 to Tg), maximum	0.012	μμf
Pentode Grid-Number 1 to Diode Plate: (Pg1 to Dp), maximum	0.004	μμf
Triode Grid to Diode Plate: (Tg to Dp), maximum	0.17	μμf
Triode Plate to Diode Plate: (Tp to Dp)	0.8	μμf

MECHANICAL

Mounting Position—Any
Envelope—T-6½, Glass
Base—E9-1, Small Button 9-Pin

MAXIMUM RATINGS

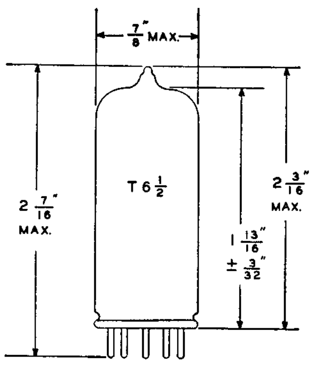
DESIGN-CENTER VALUES	Pentode Section	Triode Section	
Plate Voltage	16	16	Volts
Screen Voltage	16	—	Volts
Heater-Cathode Voltage			
Heater Positive with Respect to Cathode	16	16	Volts
Heater Negative with Respect to Cathode	16	16	Volts
Grid-Number 1 Circuit Resistance	10	10	Megohms
Diode Current for Continuous Operation	5.0		Milliamperes

Design-Center ratings are limiting values of operating and environmental conditions applicable to a bogey tube of a specified type as defined by its published data, and should not be exceeded under normal conditions.

These values are chosen by the tube manufacturer to provide acceptable serviceability of the tube in average applications, taking responsibility for normal changes in operating conditions due to rated supply-voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, environmental conditions, and variations in the characteristics of all tubes.

The equipment manufacturer should design so that initially no design-center value for the intended service is exceeded with a bogey tube in equipment operating at the stated normal supply-voltage.

PHYSICAL DIMENSIONS



EIA 6-10

CHARACTERISTICS AND TYPICAL OPERATION

AVERAGE CHARACTERISTICS

	Pentode Section	Triode Section	
Plate Voltage	12.6	12.6	Volts
Screen Voltage	12.6	——	Volts
Grid-Number 1 Voltage	0.8 #	0.6 #	Volts
Amplification Factor	——	10	
Plate Resistance, approximate	400000	——	Ohms
Transconductance	2700	1200	Micromhos
Plate Current	1.9	1.0	Milliamperes
Screen Current	0.7	——	Milliamperes
Grid-Number 1 Voltage, approximate Gm = 30 Micromhos	−2.8	——	Volts
Grid-Number 1 Voltage, approximate Ib = 10 Microamperes	——	−3.5	Volts
Average Diode Current with 10 Volts, DC applied	2.0		Milliamperes

* When used in automobile service from a 12-volt source, under no circumstances should the heater voltage be less than 10.0 volts or more than 15.9 volts. These extreme variations in heater voltage may be tolerated for short periods; however, operation at or near these absolute limits in heater voltage necessarily involves sacrifice in performance at low heater voltage and in life expectancy at high heater voltage. Equipment reliability can be significantly increased with improved supply-voltage regulation.

† Without external shield.

Average contact potential developed across 2.2-megohm grid resistor.

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